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## Profitability Analysis of Irish Potato Production in Bokkos Local Government Area of Plateau State, Nigeria

Zaknayiba, D. B\* and Mamman, B. D\*

[zaknayibadanladi@yahoo.com](mailto:zaknayibadanladi@yahoo.com)

Department of Agricultural Extension and Management, College of Agriculture, Lafia, Nasarawa State, Nigeria

### Abstract

The study analyzed the profitability of Irish potato production in Bokkos Local Government Area of Plateau State. A multistage random sampling technique was used in selecting respondents for the study and data were collected with the aid of well-structured questionnaire and interview schedule. Data were analyzed using descriptive statistics and gross margin analysis. The study revealed that, the majority (90%) of respondents were in their active years. The total cost of Irish potato production per hectare, average gross returns per hectare, net farm income obtained per hectare and returns per Naira invested were ₦224,558.8, ₦540,235.4, ₦315,676.6 and ₦2.4 respectively. The major problems faced by the farmers include shortage of storage facilities, inadequate transport facilities, shortage of capital and shortage of improved varieties. The study recommended that, there is need for Irish potato farmers to put more efforts in production activities, government and non-governmental organization to make farming resources available and affordable for farmers in order to improve their profit level.

**Keywords:** Profitability analysis, Irish potato production, Bokkos, Irish potato farmers

## INTRODUCTION

An Irish potato (*Solanum tuberosum* L.) belongs to the solanaceae family. It is a native of western hemisphere and is believed to have originated somewhere between Mexico and Chile, possibly in Andes high-land of Bolivia and Peru (Okonkwoet *al.*, 1995). Irish potatoes were introduced into Nigeria in the later part of the 19<sup>th</sup> century and early 20<sup>th</sup> century by the Europeans notably the tin miners in the Jos Plateau (Okonkwoet *al.*, 1995). Irish potato is grown for food as well as a commercial crop. It is a major source of income among the rural farmers in many African communities (Okoli, 1995). Irish potato matures in 60 to 90 days as compared to 12 months for yam and cassava, the crop is by far the most fruitful and efficient in the family of root and tubers in the world in terms of yield (NRCRI, 2005).

The production and marketing of Irish potatoes in the highland zones of Plateau State has become an integral part of the rural economy, both at the rainy and dry season as it is cultivated as a rain-fed and dry season crop (Okunade and Ibrahim, 2011).

Approximately 500,000 small holder farmers produce about 1 million tones from 100,000 hectare of cultivated land area and Nigeria production constitutes 0.3% of the world's total production and 6.5% of Africa's production (FAO, 2006). Irish potato which has been considered to be the fourth most paramount root and tuber crops in Nigeria, after cassava, yam and cocoyam (Okonkwoet *al.*, 2009), much has not yet been done towards promoting the industrial uses of the crop, thus the need to study the entire profit level of Irish potato is of great

important. The present study described the socio-economic characteristics of the producers, estimated profitability level and identified the constraints faced by the farmers in the study area.

## METHODOLOGY

This study was carried out in Bokkos Local Government Area of plateau state Nigeria. The state is located within the guinea ecological zone which is within the middle belt zone of Nigeria, (Bokkos Local Government, 1996). Bokkos Local Government Area is located between latitude 8<sup>0</sup>- 9<sup>0</sup> N equator and longitude 8<sup>0</sup>-9<sup>0</sup>E of the Green witch meridian with high annual rainfall of about 2000mm and the estimated land area covered of 29,372km<sup>2</sup>. The rainfall often last from March to November. The annual temperature is about 15<sup>0</sup> -20<sup>0</sup>C, which is favourable for agricultural production. Bokkos is about 45 km away from the State Capital is sharing boundaries with BarkinLadi LGA to the North, Mangu LGA to the North- East and to the West with Wamba LGA of Nasarawa State (NPC,2006).

Bokkos Local Government area comprise of different ethnics group with the population of about 150, 000 people and the major occupation of the indigenes is farming and petty trading (NPC, 2006).

Bokkos Local Government Area has five (5) districts namely Bokkos, Daffos, Toff, Kamwal and Richa. This study covers two districts where irish potatoes is highly produced namely; Bokkos and Daffo, as such these districts were purposely selected based on the intensity of production by small scale farmers. Twenty five farming households were randomly sampled from each of the two selected districts for this research which gave the total number of 50 irish potato farmers.

Data were collected using well-structured questionnaire and interview schedules between April and October, 2015. Information gathered include socio-economic characteristics of the farmers such as age, sex, education level, source of credit, marital status, costs and returns and constraints faced by Irish potatoes farmers in the study area. Data were analyzed using descriptive statistics and gross margin analysis.

### (i) Gross margin

This is the difference between the gross farm income (GFI) and the total variable cost (TVC). Algebraically,

$$GM = GFI - TVC \dots\dots\dots (1)$$

Where GM = Gross margin, GFI = Gross farm income, TVC = total variable cost.

### (ii) Net farm income

It is the difference between the gross margin (GM) and total fixed costs (TFC). Notationally,

$$NFI = GM - TFC \dots\dots\dots (2)$$

Where NFI = Net farm income, TFC = Total fixed cost and GM is as previously defined.

## RESULTS AND DISCUSSION

### Socio-economic characteristics of producers

Table 1 shows the distribution of the respondents according to socio-economic characteristics of respondents. The result reveals that 90% of the respondents were within the age bracket of 18-50 years. Only 10% of them were above 50 years. This implies that majority of the respondents were in their active years which can contribute to production of food in the study area. Table 1 also shows that majority (84%) of the respondents were married. While only 16% of the respondents were single. This is an indication that most of the respondents were responsible individual that can contributes to household food security. Furthermore, results indicate that most

(70%) of the respondents were males, with females constituting only 30%. This reveals that a greater proportion of Irish potatoes farmers were males. This agreed with the findings of Adedoyin and Fapojuwo (2007) that also discovered that men supplied large percent of work force in Nigerian agricultural communities. Results on educational status of the farmers revealed that majority (90%) of the respondents had one form of education or the other. Only 10% of them were non literate. This indicates that most of the farmers were educated that can accept modern farming system that help to enhance production in the study area, because education is a human capital asset that boost production. Results further revealed that 40% of the respondents had 1-10 years of farming experience, 50% of them had 11-20 years of experience while only 10% of them had year of experience over 21. This implies that the more years in farming the more experience acquired to increase profit efficiency. This is in consonance with the findings of Alabi (2003)

Table1 also revealed that 80% of the respondents did not have access to extension service only 20% of them had access to extension sources. This indicates that majority of the farmers do not have access to recent farming system which affect their profit making.

Results in Table 1 revealed that 60% of the respondent had access to credit through personal saving 30% of the respondents had access to credit through cooperative society. Only 10% of them had access to credit through bank in the study area. This implies that irish potatoes producers may likely operate at profit inefficiency level in the study area.

Table1: Percentage distribution of respondents according to socio-economic characteristics in the study area.

<b>Variable</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Age</b>		
18-30	30	60%
31-50	15	30%
51above	5	10%
Total	50	100%
<b>Marital status</b>		
Married	42	84%
Single	8	16%
Total	50	100%
<b>Sex</b>		
Male	35	70%
Female	15	30%
Total	50	100%

**Educational level**

Primary	5	10%
Secondary	25	50%
Tertiary	15	30%
Non formal education	5	10%
Total	50	100%

**Years of farming**

1-10	20	40%
11-20	25	50%
21 above	5	10%
Total	50	100%

**Extension consult**

No	40	80%
Yes	10	20%
Total	50	100%

**Access to credit**

Personal saving	30	60%
Cooperative society	15	30%
Bank loan	5	10%
Total	50	100%

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Source: Field survey (2015)

Costs of production were classified into variables and fixed. The gross returns in the study area were realized from the sales of harvested irish potatoes from the farms by individual farmers. Variables items were determined by each producer based on the quantity used for production at a particular price while fixed costs items were depreciated over time. The profitability of Irish potatoes production was examined using costs and returns analysis. The estimated costs and returns of small scale farmers in the study area are presented in Table 2. The total variable cost was ₦ 220, 518.8 per hectare of total costs of production, comprising of 65.0% of labour, 10.1% of potatoes seed, 4.0% of herbicides, 11.1% of fertilizer, 5.0% of insecticides and cost of transportation accounted for 3.0%. The total fixed cost of Irish potatoes production per hectare was ₦ 4, 040, comprising of 0.6% of basket, 0.5% for hoes and cutlass, while cost of axes

accounted for 0.2% only. The total cost of Irish potatoes for a typical small- scale farmer was ₦224, 558.8. This is an indication that Irish potatoes production required large capital in order to increase the profitability level of the farmers in the study area. The average gross returns realized by small scales Irish potatoes farmers was ₦ 540,235.4 per hectare. The net farm income was ₦315, 676.6. The return per naira invested was ₦2.4. This implies that production of Irish potatoes is a profitable enterprise in the study area.

**Table 2: Average costs and returns per hectare of Irish potatoes produced in the study area**

Costs and returns	Amount (N/ha)	(%) of Total cost
(a) Variable costs		
Labour	145,340.2	65.0
Potatoes seed	24,678.6	10.1
Herbicides	9,000.0	4.0
Fertilizer	25,000.0	11.1
Insecticides	10,500.0	5.0
Transportation	6,000.0	3.0
Total variable cost (₦/ ha)	220,518.8	98.2
(b) Fixed costs		
Basket	1,400.0	0.6
Cutlass	1,200.0	0.5
Hoes	800.0	0.5
Axes	800.0	0.2
Total fixed cost (₦/ha)	4,040.0	1.8
(c) Total cost (₦/ha)	224,558.8	100.0
(d) Gross returns (₦/ha)	540,235.4	
(e) Net farm income (₦/ha) (d-c)	315 ,676.6	
(f) Returns on investment (₦/ha)	2.4	

**Source: Field Survey (2015)**

Further results revealed that farmers encountered problems in irish potatoes production activities in the study area. The problem been faced in the study area are presented in table 4.3 the results

revealed that shortage of storage facilities (100%), inadequate transport facilities (100%) shortage of capital (100%) and high cost of inputs (100%) ranked first. This implies that reduction in profit recorded is as result of the above listed problems and it agreed with Lale and Adu-Nyako (1991) who discovered that transportation cost constitute large percentage of profit inefficiency in agricultural production in Africa. On the other hand, scarcity of improved variety (60%), poor soil structure (40%) and stealing (30%) ranked second, third and fourth respectively. Only 20% accounted for disease and pest which ranked fifth. The low ranking of disease and pest is probably due to the fact that the irish potatoes farmers in the study area have several means of curtailing them.

**Table 3: Percentage Distribution of respondents according to constraints faced in their production activities.**

Constraints	Frequency	Percentage	Rank
Shortage of storage facilities	50	100%	1
Inadequate transport facilities	50	100%	1
Shortage of capital	50	100%	1
Scarcity of improve varieties	30	60%	2
High cost of inputs	20	40%	3
Poor soil structure	20	40%	3
Stealing	15	30%	4
Disease and pest	10	20%	5
Total	275		

Source: Field Survey (2015)

Note: \*Implies that multiple responses were recorded

### CONCLUSION AND RECOMMENDATIONS

Based on the results of this study, it could be concluded that Irish potatoes production in Bokkos Local Government Area of Plateau State is a profitable venture. Therefore, there is need for Irish potatoes farmers to put more efforts in production activities, also to join co-operative societies that will boost their source of funds for production purpose.

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